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ENGLISH AS A SECOND LANGUAGE AND A TECHNIQUE FOR TEACHING SCIENCE.

BY- SMITH, PHILIP D. MAREAN, JOHN H.
NEVADA STATE DEPT. OF EDUCATION, CARSON CITY

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THE DOCUMENT CONTAINS TWO SPEECHES--ONE ON TEACHING ENGLISH TO INDIAN STUDENTS AND THE OTHER ON A TECHNIQUE FOR TEACHING SCIENCE. THE FIRST DISCUSSES THE PHONOLOGY OF THE ENGLISH LANGUAGE, LEARNING THEORIES, VOCABULARY DEVELOPMENT, AND INDIAN STUDENTS' LANGUAGE FLUENCY. THE SECOND DISCUSSES VOCABULARY PROBLEMS INVOLVED WITH TEACHING SCIENCE TO INDIAN STUDENTS, AND SUGGESTS AN UNTESTED METHOD FOR TEACHING THEM SCIENCE. THIS PRESENTATION WAS DELIVERED TO THE ANNUAL SEMINAR "PROBLEMS IN INDIAN EDUCATION" (2ND, UNIVERSITY OF NEVADA, JULY 16-17, 1964). (CL)

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Byron F. Stetler
Superintendent
of Public Instruction

STATE OF NEVADA
DEPARTMENT OF EDUCATION
Carson City

C. H. Poehlman
Supervisor
Indian Education

1966

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
OFFICE OF EDUCATION

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ENGLISH AS A SECOND LANGUAGE
A presentation delivered to Second Annual Seminar "Problems in Indian Education" at the University of Nevada, July 16 and 17, 1964.

By Philip D. Smith

The biggest problem that faces those concerned with teaching English as a second language to Indian children is convincing people that this is truly a problem. There is a definite need for serious consideration and discussion of this topic which has been too long overlooked. The need to examine the problems of the Indian as a speaker of English are three-fold: society, we as professional educators, and the Indian students themselves are all interested in contributions that Indiar children may be able to make and that they are often prevented from making

Our society, the end purpose of public education, needs productive individuals. The non-productive are often not only non-productive but destructive. This nation, as indicated by the National Defense Education Act of 1958 with emphasis on the teaching of modern languages, is in desperate need of speakers of several languages. The Indian child who has both a fluent command of an Indian language and English--including adequate competency in the written skills--is a definite asset both to himself and to our society.

For years studies indicated that bilingual students may have had low intelligence. We realize now that many such studies were made using comparisons between two heterogeneous groups of people. Recent studies in which care was taken to maintain a careful equation of the socio-economic and cultural backgrounds of the students tested indicate that bilingual students have a higher intelligence than those who speak only one language. It is hypothesized that bilingual students are able to conceptualize better.

A second asset that the speaker of two languages may have is the ability to acquire a third, a fourth, or more languages that he may need in the future life. We have not yet been able to measure the difficulty of acquiring a third language but we think that it may be at least fifty percent easier than the second and that successive languages become easier. The best evidence of this is the fact that most language teachers who acquire fluency in two languages often can acquire a third with much less effort and that persons who spend their lifetime in teaching languages may speak as many as forty or more languages.

We as teachers are vitally concerned with the teaching of English as a second language for several reasons. In the first place we must assume two roles, that of the teacher and that of the native speaker of the language. As a teacher we must know and

understand our own language. In almost every case we have only a superficial knowledge of our own language and a great many misconceptions about language. We are also placed in the position of being a native speaker or a model of the language for the child who is learning English. We must be accurate in both our description and our pronunciation.

Most of us have a very poor background in the English language. I am sure that our English teachers would agree but unfortunately even English teachers themselves have a poor background. Leonard Bloomfield, one of the great American linguists, wrote in 1933, "Our schools and colleges teach us very little about language, and what they teach us is largely in error."

Unfortunately, thirty years later, this is still true. A teacher is able to obtain a major in a language and be on the surface qualified to teach with a very minimum of study of the structure of English. Most of the credits applied to the degree will be in the field of literature with possibly as little as six hours in English grammar and composition. Most of the teachers of Indian children, like ourselves, do not even have a major in the field and often can only rely upon what we remember of our own high school and college freshman English courses.

Examples of our poor preparation in English are the fact that the first complete linguistic study of the English language is only a little over a decade old; ninety-nine out of a hundred speakers of American English are unaware of the sounds of the language. How many classroom teachers, for example, are aware of the fact that we pronounce the English "p" in three different ways: with a puff of air as in "pin", without a puff of air as in "spin" and with a complete closure of the lips as in the word "stop". We are unaware of the intonation of our own language--the tune that we speak. To a foreigner English sounds very much like Chinese because we use a wide variety of pitch levels and intonation patterns. The recent college language textbooks Modern Spanish and Modern French illustrate this fact by providing the learner of these languages with graphic illustrations of sentence intonation. In English stress is quite important and we find that this is the sole distinction being made between nouns, verbs, and adjectives in words like "rebel" and "present".

Most of us are even unaware of the fact that things are not necessarily as we learned them when we were in high school. How many teachers are aware of the difference between consonants and vowels? A consonant is defined in the dictionary as a sound produced in the mouth, throat or nasal cavities by some sort of touch or restriction of the passage of air. A vowel is that which is not a consonant although we long ago learned that the vowels are a, e, i, o, u, and sometimes y. The structural linguist would have us pronounce the word "deer" and ask us where our tongue is at the end of the word. In this way we are made aware of the fact that the

"r" can be classed as a vowel or semi-vowel in modern American English, quite to the contrary of what we have been parroting for a great many generations.

Most teachers are unaware of the structure of the English language. For example, let us take the problem of negation. In English we find pairs of sentences such as "John likes cake / John does not like cake" and on the same pattern "John is tall / John is not tall." How do we explain to the students why to make one sentence negative we add "does not" and in another we add simply the word "not".

Another prime example using articles and pronouns is "He put his foot in his mouth" and the similar "He put his foot in the shoe." Why cannot we say "He put his foot in the mouth." This obviously follows the same pattern and yet we cannot interchange these two and speak acceptable English. How do you explain this to a child?

A few days ago I laid a report on the desk of a professor at the University of Nevada and asked him if he had "seen it". He informed me that, "you showed it to me but I have not yet seen it." We know what he means--but as a teacher are we aware of enough of the structure of the English to explain this to a person who is learning English for the first time.

A fine example that we have learned to parrot for so many years is the formation of the English plural. All of us can readily quote it, "if it ends in a consonant add "s", or if it ends in "s" add "es". How true--when you're speaking strictly of the written language and ignoring foreign imports--but how false when dealing with spoken English. Form the plural of the common words cat, dog, and glass. You'll come out with cats,dogz and glassez. If you listen carefully you will notice that we have formed the English plural in one case by the sound s, in the second by the sound z, and in the third by the sound ez. Again, things are not what they seem.

Most important, the Indian student also is interested in learning English as a second language. He comes to our school system with a language, it may be an Indian language which he speaks very well--it may be English which seems to be quite fluent--or it may be both an Indian and the English language, both of which he may speak seemingly fluently or both of which he may speak poorly. In any case, he comes to us with language.

A person's language is part of his personality and shapes his thinking processes. Language has been called a "weapon and a wall." It is the instrument of survival and is basic to the human organism. It is also basic to emotion and with it man expresses his feelings, his hopes and aspirations, his fears, and his loves. In its highest forms language is a medium of art in all societies--from the sophisticated presentations of Shakespearean drama and the poetry of Homer

to the epic history of the clan repeated in a dying language by an old man as he sits in front of the fire.

Language is personal property. No matter what language the child speaks it must not be suppressed and it must not be ridiculed. For too long we have done this and we have warped the personalities of thousands, perhaps millions, of persons--stifling intellect and expression. How many generations of the Indian children have been forced to be poor speakers of two languages, inhibiting their growth in either culture. They often learn their own language imperfectly at home and English imperfectly in our schools. They have little or no communication with their own people and little or no communication with the English speaking world.

We must respect what language the student has--no matter what it is or how well he speaks it. All we as educators can do is ask him--and here we must guide him as teachers and show him the proper choice--to increase his competency in the English language which he will have to face in the Twentieth Century world. We must ask him to add English, as a second language, to his linguistic repertoire.

WHAT IS LANGUAGE?

What is language? No one really knows. Definitions depend upon the viewpoint and everyone knows the story of the blind men who were asked to feel the elephant and give their impressions of the beast. Since each one felt a different part each one reported that the elephant was like some other totally different creature.

We do not even know how many languages there are in the world. There are still many unknown and still unclassified. We are able to trace the affiliation of languages through comparative studies and to date with relative accuracy the history of most languages. In the main, we can say that three disciplines each have a different viewpoint as to the nature and composition of language. These are the view of the psychologist, the linguist, and the anthropologist. We as teachers must accept all three of these and be prepared to work with them.

The psychologist defines language as a system of symbols. The selection of these symbols is purely arbitrary but they are simply a system of vocal sounds and gestural symbols. The organism emits an utterance which when received by another organism triggers a response or a rejoinder. We will discuss some more of the psychologist's ideas later when we discuss some of the theories of language learning.

The linguists view of language is also one of a complex and arbitrary system of vocal sounds. He will divide language a great many ways but is primarily concerned with three layers. These are

the sound system, the structure and the vocabulary. To the linguist-scientist the vocabulary is perhaps the least important of all three, while we have traditionally placed emphasis upon this item in second language learning.

The sound system of any language has sounds in common with that of other languages. There are hundreds of possible sound combinations that can be made by the human body. Here I would like to distinguish carefully between the words "phonic" and "phonetics". As educators we are often exposed to both of these terms and I would like to remind you that phonics is the science of associating certain sounds with certain written symbols. Phonetics is the study of actual sound production from the body and has nothing to do with the written symbols except as we may use a sort of short hand to keep track of the sounds we may be discussing.

From front to back we can make all sorts of sounds from the labials and the dentals through the sounds made on the roof of the mouth to the back of our throat and finally to the glottis where we can turn off our air at the vocal cords themselves. We can make sounds through our nose, we can suck air in to make implosive sounds, and we can click our tongue, lips and teeth as are done in some African languages.

In case you are interested, common features of the phonetics of Western American Indian languages are that they often pronounce their p, t, and k without a puff of air as we commonly do in English. Glottal stops are rather common as in the Washoe word for "lake da'au". This is interpreted by the white man as "tahoe" Indian languages are also different from English in having initial nasal sounds, (words beginning in our ng combination) and whispered vowels. Paiutes, in particular, use whispered sounds. The closest sounds like these which you might be familiar with are the released consonants of French as when one can barely hear the sound on the end of the word <u>table</u>, <u>Alice</u>, <u>fenetre</u> in slow precise speech.

We must remember that not all sounds have meaning. Remember the three sounds of the English p. These make no difference in meaning to us and we can interchange them although this will give us a slightly "funny sound".

There are things that carry meaning also that do not come within the realm of pure sound productions in the head. These are intonation, pitch, and juncture. Intonation distinguishes between the words "lighthouse keeper" and "light housekeeper". Pitch determines whether or not a sentence or word is simply a statement of fact or a question. Juncture the pause between syllables, makes the difference between being serious and funny in "what is that in the road ahead?" and "What is that in the road, a head?"

The linguist is also concerned with the structure or patterns of the language. An example of this is syntax, the arrangement of words in a sentence. Here we have an arrangement like English, "He picks flowers often." Although the sounds might be different the Frenchman would also say "He picks flowers often." The Spaniard would combine "He picks" into one word and say "Hepicks flowers often." In Gaelic the speaker would follow his normal word order and say "Picks he flowers often." In Japanese, on the other hand, the verb must always come last in the sentence instead of first as in Gaelic and the Japanese would say, "He flowers often picks."

The linguist is also concerned with morphology. This is a technical term which is used to distinguish sounds which carry meaning. For example, the word books consists of two units of meaning called morphemas. These are book and s. Each of these carries meaning, "book" signaling a concept of something with two covers and pages and the sound s signaling the fact that there are more than one.

Lastly, the linguist is concerned with vocabulary. Traditionally scientists of language have been concerned with the philology or the tracing of words back through various languages toward the beginning.

The modern linguist is least concerned with this type of activity and uses vocabulary only in connection with the study of the sounds and structure of the language. From his viewpoint the mastery of the sound system and the structure come first and vocabulary can be added at a later date.

Since most of us here have been in contact with Indian children and have been exposed to varied amounts of anthropology we are probably most concerned with the anthropologist's viewpoint of the nature of language.

A DOZEN FACTS ABOUT LANGUAGE

Developed by the Modern Language Association of America, May 1963.

1. Speech is one or more sounds made by human beings for purposes of communication. The communication is language.

2. Languages are different, not just in having different words for things but in arranging words in different ways to express different reactions to reality.

3. A language is more than just a string of words; people also communicate by such means as structure, stress, pitch, and pauses.

4. Changes in language depend on time, place, social level, stylistic level. These changes are not corruptions but normal features of all languages.

5. Speech and writing are different, though related, language systems. In all languages, speech preceded writing. Most of the world's languages still have no written system.

6. Language has nothing to do with races. Primitive peoples do not speak "primitive" languages. The languages of simple cultures ("primitive peoples") are not necessarily simpler than the language of highly complex cultures.

7. English sounds just as strange to a foreigner who doesn't know English as the foreigner's language sounds to monolingual speakers of English.

8. Different languages have different taboos. In English, Good Lord! is milder than Good God! although they "mean the same."

9. Words for "the same thing" in two languages are not "equal to each other" unless basic meanings and connotations both correspond -- and they hardly ever do.

10. Lexical meaning, expressed by selection of words (tall man, short man), must be distinguished from grammatical meaning, expressed by their inflection (speak, spoke) or arrangement (house dog, dog house).

11. No language is inherently difficult; if it were, the people who speak it would soon simplify it. Any normal child has a firm control of his own language by the time he goes to school.

12. Language learning has more need for analogy than for analysis; most of all, it calls for patience and time.

HOW IS LANGUAGE LEARNED?

The language learning process is indeed mysterious and we may never know how language is learned. The medical profession has given us research into language learning areas of the human brain and we are told, in over-simplified terms, that the language areas of the brain are in a fluid or plastic state and will accept and create new nerve pattern and centers concerned with language until the onset of puberty. A great deal of work has been done by Dr. Penfield, of McGill University in Toronto. He informs us that man has a biological time clock and that to teach a language with most efficiency we must teach it to the child before he begins to develop into an adolescent.

The psychologist has been spending a great amount of time in recent years on the nature of language learning. The early behaviorists developed the pure stimulus-response theory. Later they were wise enough to realize that this is not always so and that the stimulus acted upon an organism which responded and that the organism varied in response from time to time. Dr. Skinner with his type R theory has developed the sequence of a stimulus, organism, response, and positive or immediate feedback to the organism which reinforces the response. Mowrer has refined this to the sequence of an organism reacting to a stimulus produces a response which feeds back to the organism and is modified by the organism to change further responses. This accounts for the extinction and suppression of wrong responses as well as positive reinforcement of correct responses.

We must remember that language learning is both active and latent and that the learner listens by hearing other persons speak, by seeing members of his class make mistakes and be rewarded or punished, and that there are a variety of rewards to responses. These may take the form of an actual reward of some sort, a grade, for example, or punishment. It may take the form of either acceptance or rejection by the child's peers, his family, or society, or the form of praise from the teacher as opposed to correction and ridicule.

Often this has been the case and one child observing another being corrected, punished, or rejected will refuse to participate in a learning process rather than face this sort of experience.

THE SITUATION OF THE INDIAN CHILD

We must remember that the Indian child when he comes to the public schools is usually not a true bilingual. If he speaks two languages he is probably poor in either one or both. He does not usually think in his second language.

We cannot equate the Indian child with the foreign student who comes to school to study in the United States. They are often very bright and have competed with other students of a very high caliber to come to the United States to study. Their English may not be fluent but their intellect is usually distinctly superior. In the public elementary and secondary schools these children may be immigrants but we must remember that they have the advantage of a common culture and tradition with us that the Indian child does not have. These people often will be poor in English language skills where the Indian child may seem to be very fluent.

We must also at the same time remember that the Indian is not the same as the remedial student that we have although he may soon become a remedial student. The remedial student is usually poor in English mechanics, sentence sense, and is often of below average intellect. The Indian child may be extremely bright and often has a good command of the mechanics of English insofar as he has been able to learn them. What the Indian child lacks is a command of the vocabulary of English, especially phrases which are idiomatic or culturally orientated.

The Indian child lacks the western European tradition with which the Native English speaker is acquainted even in his preschool years. Biblical, historical, and mythological allusions mean little or nothing to the Indian child but are quite common to the English speaker. The Indian student will miss the overtones of meaning, satire, emotion, suspense, and sarcasm. These are carried by nuances in the context rather than by vocabulary and syntax. The Indian child will not or cannot participate in many language learning activities, even in such a simple activity as listening, until he is taught to do so. Lastly, it almost goes without saying that language deficiency seriously affects all learnable areas of study and the Indian child will quickly become a remedial student even in such nonverbal skills as arithmetic simply because he cannot understand directions.

The average speaker of almost any language on the face of the earth uses no more than four to five hundred words in every day conversational speech. To a literate native speaker of any European language, these four to five hundred words represent an active vocabulary which is only five percent of the total needed to maintain a productive place in society. In most English textbooks the recognition vocabulary, which is far greater than the active vocabulary, passes the active vocabulary in the latter part of the third or the early part of the fourth grade. This is where the child who is poor in vocabulary will begin to fall behind.

The Indian child while seemingly fluent in English with his command of the four to five hundred words used by all students, is often really a linguistic facade. The American child in the fifth grade will only use these five hundred words in every day conversation but is able to recognize in reading and use, to a limited extent, in writing, many more words. The adult speaker of English has his active vocabulary of 500 words and a recognition vocabulary of 10,000. The Indian, on the other hand, will have the active vocabulary of 500 words and a recognition vocabulary perhaps of only 500 more.

The Indian may seem to be totally fluent in the spoken English language but is at a serious disadvantage simply because we assume since he speaks with facility and understands everyday directions and situations that he has much more of a mastery of the English language than he really has. This is a trap into which generations of educators have fallen and we must be very cautious.

We can assume in most cases that the Indian child will have mastered the sound system of English and much of its structure. The biggest role that the teacher can serve in the development of English as a second language to Indian children is in the building of a large recognition vocabulary to enable the student to compete with his English speaking peers.

GENERAL ASSUMPTIONS ABOUT LANGUAGE AND LANGUAGE LEARNING

We have defined the language as an arbitrary system of local symbols. We must remember also that these represent communication and that sound with no listener to respond becomes nothing but sound. Let us also remember to make the distinction between the written language and the spoken language. The written language is purely arbitrary and we can have two languages that use an identical sign to represent two different sounds. Chinese (chen) and Japanese (hito), are written identically. We find that two languages which are not of the same family and are in nowise similar can have one writing.

On the other hand we can find that one language may choose to have two writing systems, evidenced by the Scot's and the Irish dialects of Gaelic. These people speak the same language but choose to write them differently. The Scot using the modern Roman alphabet while in Ireland

one finds the ancient Cehic alphabet of the Ninth Century. Thus one language can have two writings and a native speaker of Scot's Gaelic will have difficulty in reading Irish even though it is basicly the same language he speaks. The Chinese and Japanese cannot understand each other in spoken language but may be able to communicate by means of notes. The writing system we chose is purely arbitrary and can be changed or adapted at will. Probably half of the languages of the world are not in extensive written form except as they have been annotated or described in the shorhand of the descriptive linguist.

BASIC PREMISES: Any language consists of an arbitrary system of sound and arrangement contrasts used by a society for communication. The language of a society can be recorded and preserved by an arbitrary set of graphic symbols called writing.

AXIOMS: 1. There are two basic skills required for the use of any language: the ability to recognize the sound and arrangement contrasts of the language and the ability to produce them automatically.

2. To acquire skills is to acquire habits. A habit is formed by repeating an act until it becomes automatic.

3. Some of the sound, arrangement and cultural habits of the mother tongue are similar to those of the foreign language; others are in conflict. Similar habits are easily transferred; conflicting habits cause interference and necessitate special repetitive training.

4. The ability to recognize the sound and arrangement contrasts of a language is a listening skill; the ability to produce them is a speaking skill.

5. The listening skill must precede the speaking skill and must be taught, but it is retained longest of all language skills.

6. Reading and writing are further skills related to and depending on the two basic skills; their acquisition should therefore follow that of the spoken language.

7. The four skills, listening, speaking, reading and writing, although interrelated, constitute separate areas of special training.

8. Since sounds and words are normally not used in isolation to communicate ideas, they should not be so practiced. A limited number of words should be acquired, but they should always be learned and practiced in context.

9. "A person has 'learned' a foreign language when he has... first, within a limited vocabulary, mastered the sound system (that is, when he can understand the stream of speech and achieve an understandable production of it) and has, second, made the structural devices (that is, the basic arrangements of utterances) a matter of automatic habit" Charles C. Fries, TEACHING AND LEARNING ENGLISH AS A FOREIGN LANGUAGE. p. 3

In order to fully carry out what we know about language and language learning with children from Indian backgrounds that come to our schools, we first need to create or capitalize upon the experience in which the need for teaching English is apparent to the child. We must use what language he has as a starting point. In education today the great cry is "Articulation". Unfortunately, this is a problem that will never be completely solved and the best solution to any articulation problem is to take the child where we find him and carry on as best we can.

Secondly, we need to develop systematically a vocabulary within the realm of the child's experience with which he can express himself.

Lastly, we need to develop systematically an automatic control and fluency in the accurate and natural use of English language patterns.

As teachers of English to children with a minimal language background in the language we must find out where the child is and assist him to develop from this point. It would be wise to insist upon verbal responses whenever possible in a classroom. Label classroom items that may be outside the experience of the child. He may never have seen a pencil sharpener, a window opener, or even a floor. May I suggest that you conduct your children on tours of the school plant and show him the boiler, the restroom with its plumbing, and the things in the school which we take for granted.

Both the classroom and the playground lend themselves to vocabulary building and action words, comparison words, colors and sizes, and a thousand other verbal activities in the early grades. Teachers have known for years that one can easily capitalize on games and songs.

One of the greatest traps that we have let outselves fall into is the "Show and Tell". It is easy for the child from the American middle class family to "Show and Tell". However, we must remember that the Indian child is not taught to do this in his own environment. Most Indian children do not feel that what they have is superior to that of others since their culture is oriented to a feeling of identity with a group.

The process of "Show and Tell" in American schools in most cases has fallen into, "Let me show you the new toy or game that I received." This is indeed unfortunate for it is a disservice to a valuable learning experience that has been of great value even to native English speakers. Let us remember that the Indian child does not have new things to "Show and Tell."

It would be much more meaningful if teachers would insist upon each child bringing something to class from the world of nature. This is a world which the Indian child knows and has in common with the English speaking child. Here he does not have to compete in the world of economic excellence but can compete and probably excell with his ability to observe and describe. Such "Show and Tell" times not only

provide good active verbal experiences for both Indian and English speaking children but might provide the basis for science instruction. Care should be taken to label the items brought to school by each child. Large items could be placed on shelves while leaves and insects could be pressed or mounted for display.

Again, I would like to stress that the basic problem is building an active vocabulary for the Indian child as a base and then extending this many, many times to develop a recognition vocabulary. We must remember that we cannot equate the ability to pronounce a series of sounds that to us mean a word with a real understanding. Most of us know what a tortilla is--we think. Immediately the flat corn cake of Mexico will come to your mind while to those who are familiar with Spanish food, a tortilla represents an omelet, as distinguished from Mexican. We think we know what things mean, but such is not always the case.

One thing that we must be careful of is the dictionary. This wonderful learning tool should be used by all students and it would be best if there were a dictionary for each child. We must remember when dealing with children who do not have English as a native language that there are many problems that face them that are not too severe to the child who comes to school with a good background in the language. In the first place, constant use of the dictionary is extremely time consuming and discouraging to the child. In foreign language teaching this has been called the exercise of the flexible thumb. It would be much better if our textbooks would copy the pattern of the foreign language texts and use marginal glossaries rather than a series of definitions at the back of the book.

Also the definitions themselves may contain many unfamiliar words which may need definitions. Almost every word in the English language has several meanings and we cannot escape the fact that all definitions are not given since a great number of them depend upon the context. Finally, those who are familiar with English forget that many words are not listed in the dictionary such as the plural forms of certain nouns and verbs.

Class charts and pictures can be used as wonderful vocabulary builders and we have too often overlooked the flannel graph.

We must remember that we must make ideas relative. To the Indian child in the north who has never seen a horse, we must make clear that a horse is much bigger than a dog. To the child who lives in the south, we must make it clear again that snow is different from sand.

When dealing with the vocabulary expansion of children, it is always best to encounter new words in context. The child under eight years of age cannot absorb more than five new words per day. While the child over the age of eight can possibly acquire as many as eight. Sentences should be kept as short as possible. The teacher should be careful to utilize only useful spoken English, avoiding strained constructions.

Every word of every sentence must be "over-learned"--acquired until it becomes a habit--not necessarily in one day's lesson.

Material should be at the level of the student and the vocabulary to which he is presented must represent something which is real. Encourage students to discuss freely, to identify with a group and always maintain the speaking of the language basic. Seek the student's interest.

Write out discussion questions for the students to prepare in advance when beginning with reading selections. They can prepare the answer and have them to discuss in class. It might be wise from time to time to have them clear their desks and write out the answers to the discussion questions. If they are prepared they will know the answers, and will verbalize in a situation with which they are familiar and respond to a stimulus to which they have already been exposed in another form. In oral discussion call upon the good student first. He will contribute a correct answer and the others will listen and learn by latent participation.

We should not forget, however, that you must also call upon the poor student. It is all too often too easy to call upon the good students every day and never get around to the poor ones.

The student should become used to hearing the English language. Listening is a skill and I can speak to a group such as you, dropping out a number of phonemes from my English speech as I proceed. You will continue to understand what I am saying since the understanding of any language depends actually upon only about one-third of the sounds made. Your mind supplies the necessary sounds to fill in the gaps. When teaching punctuation we must remember that the student must be trained to <u>hear</u> the punctuation. This will make it much clearer no matter what his background in language.

Writing is best taught by having the student first copy, a process we do in the first few grades, and then proceed to write from a short dictation by the teacher. In the intermediate grades we must guide the student into composition and only in the very last steps of language learning can we expect him to enter into free composition.

English vocabulary can be expanded greatly by a study of the prefixes and suffixes of the language. A study of Latin and Greek prefixes and suffixes which are common in English will allow the student to expand his reading vocabulary tremendously. This can be done in several short units throughout the grades and we must be careful to distinguish between deviational prefixes and suffixes and the inflections of the language which determine case, number and tense.

One of the most difficult concepts for the Indian child is the English verb because his concept of time is different from that of ours. The Indian is most concerned with now and both the past and the future are indefinite. This is also true of the Spanish speaking child, although his concept of the past is in some ways more definite than that of English.

Time-lines on which time can be expressed graphically showing the past, and the future, are the best way to explain the English concept of time to a person from another culture. The verb tenses themselves are rather confusing and will present a great deal of trouble to non-English speaking children. For example, the paradigm of the verb to be in the English language is, "I shall, you will, he will, we shall, you will, they will." Now even school teachers still habitually use the word "shall" in everyday speech. It has been almost replaced in American English by "will" for a great many years. In reference to this same future tense we must also remember that English makes great use of the progressive, i.e. "I am going to do it" in place of "I will do it."

In English we can use one verb tense in place of another. A prime example in English is that we can use the present tense to discuss future time. We do this simply by taking the sentence, "We give it" which is normally the present tense and imply a future by saying "We give it next Tuesday for the P.T.A.."

Even more confusing to a learner of English is that we can also use the past tense to express future time. We take the form which normally represents the past time. "He studied" and place it in the future context by saying, "If he studied tomorrow, he might pass the test."

The Indian child will have a great deal of trouble with the English idioms as any learner of a language will have trouble with the idiomatic expressions which are peculiar to that language. We talk about obscene stories as being "blue". In Spanish they are "green". In English we "take a nap" and "throw a party". In Spanish we "throw a nap". These idioms are present in every language and are a problem for the learner of any language.

For those of you who are interested, as an item of information, the most common words in the English language are the smallest words. They are one syllable markers and connectors that will provide a great deal of difficulty for any learner of English. In order they are: the, of, and, to, a, in, that, it, is, and I. It is interesting to note that English is one of the few languages in the world in which the pronoun I is consistently capitalized.

SUMMARY

In conclusion, let me again stress that the biggest problem facing teachers of Indian children is the fact that we still assume because the child may make the sounds of English in a seemingly fluent manner that he has a command of the language. Let us remember that the average person's speaking facility represents only 5% of the language which he has at his command. In the case of the Indian child this may not be true. What we hear may not represent just 5% of his vocabulary but perhaps as much as 50% or 90%.

In addition, remember that the vocabulary that he has may not necessarily be attached to the same cultural symbols and concepts that we could attach to the same word. Our concept of "floor" may be far different from what is used in the home of the Indian child. Our concept of such abstracts "love" may not mean the same thing at all. Although the Indian student may be able to spell the word correctly, use it in a sentence correctly and even tell the teacher that "I love you".

Too long have we wasted the abilities of many students by not realizing that they can be made to accept a second language to the degree that they will earn their living with it, use it to record their life's experiences and pass it on to their children who will come to the schools again to be our students. No one is a complete master of the English language--or of any language. We all master our own idiom only to a degree, albeit some much better than others. Language skills are basic and essential not only to human communication but to the survival of the personality.

A TECHNIQUE FOR TEACHING SCIENCE TO INDIAN CHILDREN IN ELEMENTARY AND SECONDARY SCHOOLS

By John H. Marean

The title which you and I were provided for my presentation was "Technique for Teaching Science to Indian Children in Elementary and Secondary Schools". I would like to amend it slightly. First, I have only one technique to suggest, and it would seem appropriate to prefix this with the article "A". Then, since this is essentally an untried hypothesis, and we, in science, are eager to be objective, it would be better to state this as a question or a guess. Thus I would add a question mark to the end of the title.

To lend background, we must certainly consider the nature of education and the nature of the child. During your meeting here you have surely spent more time on these subjects than I have done recently.I expect you have looked rather closely at the nature of Indian children. But it does seem that the nature of an Indian child is not wholly compatible with the nature of the education we have established for other members of our society. Our lack of success with teaching Indian children may indicate this.

Let us look briefly into the nature of teaching science. For convenience, I will compare two methods of teaching and from this, I hope we may obtain the first clue to the development of the technique I will elaborate. I will call one method "traditional" and I will call the other teaching by inquiry. The characteristics of these two approaches are as follows:

TRADITIONAL	INQUIRY
1. Authoritarian	Heuristic
2. Verbal	Empirical or Experiential
3. Encyclopedic	Conceptual
4. Compartmentalized	Inter-related or unified

One of these words migh need some elaboration. Heuristic means "Aiding or guiding in discovery; inciting to find out".

Next, let us look at what I believe are somewhat unique characteristics of Indian children which make them well suited to learning by an inquiry method of science instruction.

1. They resist abritrary authority.
2. They are inclined to accept a challenge.
3. They are skilled in manipulation; they are dexterous.
4. They are generally weak in verbal expression.
5. They are probably talented in remembering; they may thus be well adapted to encyclopedic learning if there is a convenient way to retrieve the information.

6. They are capable of unique conceptualization as is shown by their language. Compare the names which we have given to natural features, let us say lakes, with those of the Indians. Our maps describe Mammoth lakes, Clear lakes, Twin lakes or Finger lakes. Nowhere, however, do we have a Tahoe--Lake of the Skies. This ability to make unique relationships is one of the keys to advancement in science, and I might add, in the arts.

7. They are keen observers. We use them as trackers.
8. They draw interesting relationships within their environment. "They use "signs" in order to predict weather, and the like. The fact that many of these are not founded on rational cause-and-effect relationships is probably not as important as the fact that they exist. With the proper background and approach in science, they may find more reasonable relationships founded on valid experimentation. Their visionary ability may not be destroyed by the teaching as readily as it seems to be in other children.

Now briefly, let us look at the nature of science itself. It is, according to one definition, "Disciplined Curiosity". Curiosity manifests itself in activities aimed at finding out. Investigation, experimentation, with observation and the synthesis of findings developed into conclusions result from the application of curiosity. The extent to which intellectual discipline is practiced has much to do with the quality of observations and the validity of conclusions.

Here is the basic technique which I would suggest. Experiment on our own to determine the validity of this hypothesis. I believe that we may stimulate Indian children into an interest, and some success, in science learning if we will encourage them first to exercise their superior observational ability. So many of us pass by, without seeing or hearing some of the more obvious and intriguing objects. We become sterile as observers, having accepted the premise that, through films or television, textbooks or newspapers, we will be shown all that we need to see. Members of a do-it-yourself society strongly resist any attempt on the part of others to teach them something. Devise activities appropriate to the level of interest and ability of the children you teach which will help them become better observers. While this will require some communication ability, it seems a little easier to convey a crude description of what one observes than of what one thinks. Children who are weak in communication skills may reach satisfying success and become enticed into improving their writing or speaking ability. Thus, from this improved observational ability and, hopefully, improved communication skills, it might be that these children would begin to work toward the solution of science problems. From random observation we could move to directed observation and then to observation under controlled conditions. The next step in science problem solving development would be to draw conclusions from the observations under controlled conditions and then amend the conditions in order that the observations might result in more accurate conclusions.

You, in your classroom with a knowledge of the children with whom you deal, can best decide the kind of activity in observation that is most valuable. We should avoid, it seems, selecting those objects or events which require a highly specialized vocabulary. If students are asked to relate their observations about the weather, it is far more important to have them decide that the kind of cloud they see is the sort they associate with a thunderstorm than that it is a cumulonimbus. Verbalization at this point is not important and too much stress on verbalization may actually conceal understanding. A good vocabulary is important, and science has come to its present state because it has sought always to achieve higher precision, but it would not seem too important to thwart a description by correcting a student who refers to a caterpillar as a worm. On the other hand, this may prove to be the context in which such distinctions may be most easily made.

Most of us will be surprised at the acuity with which children will observe things in their environment. We parents often feel this strongly when it is obvious to us that our children always see the things we think they should not, or hear the words we thought we had kept from their ears. Showing a picture to all of the students at the same time will give them an opportunity to share in their observational experiences and permit the less skilled or talented to learn from those who seem more capable. You may find that there are things in your own pictures which you had never seen before. The most thrilling experiences come, it seems from inferences which may be drawn from that which is observed. This is where this activity becomes like the observational sciences such as astronomy, archaeology, historical geology or anthropology.